

A novel application of the hydrostatic test in determining live (non)-birth

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ABSTRACT

It is important to determine whether a foetus had been born alive since various legal consequences follow upon such a determination. This article is concerned with the determination of live birth in terms of section 239 of the Criminal Procedure Act 51 of 1977 and live non-birth, the latter concept as transpired in the case of *S v Mshumpa* 2008 (1) SACR 126 (E). The medico-legal importance and risks of the hydrostatic test in determining live birth will be considered and its novel application in determining breathing before birth (live non-birth) for the purpose of criminal proceedings will also be discussed. Reference will be made to case law and legislation from the United Kingdom and selected states from the United States of America in order to show that section 239 of the Criminal Procedure Act 51 of 1977, which requires only that it be proved that a foetus had breathed in order to establish live birth, does not take into consideration the present medical opinion on the matter, or the legal developments with regard to infanticide and the determination of live birth in other jurisdictions.

1. Introduction

Whether or not a foetus had been born alive remains a controversial and contentious problem in forensic medicine.¹ From a legal perspective, it is also very important to know whether a foetus was indeed born alive as legal subjectivity is only afforded to a foetus upon live birth. Many other legal consequences may also follow upon a determination of live birth. For example, the primary objective of the provisions of the Inquests Act 58 of 1959 is that investigations into the circumstances of death be held where a reasonable belief exists that a *person* has died from unnatural causes. Whether this reference to *persons* also includes a still born baby was considered in *Van Heerden v Joubert NO & others*.² Grosskopf JA for the Supreme Court of Appeal found that the term *person*, in the context of the Inquests Act, should be given

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¹ JJ Moar 'The hydrostatic test – A valid method of determining live birth?' (1997) 18(1) *The American Journal of Forensic Medicine and Pathology* 109-110.

² 1994 (4) SA 793 (A).

its ordinary and literal meaning and does not include an unborn (or stillborn) child.³

Another example where the law requires a determination on whether a foetus was born alive is in terms of sections 4 and 9(1) of the Registration of Births and Deaths Act 51 of 1992. In terms of these provisions all children born alive must be registered within 30 days after the birth. And, section 18 of the Act requires that a medical practitioner who was present at a still-birth, issue a prescribed certificate to that effect. If a medical practitioner was not present, a person present to such a still-birth must make the necessary declaration thereto. Non-compliance to this provision constitutes a criminal offence in terms of section 31(1) of the Act.⁴

The primary focus of this article will *not* be on the commencement of legal subjectivity. The discussion will also not include references to the pro-choice/right-to-life debate or wrongful life case law and arguments. The primary focus of this article is rather to evaluate the medico-legal considerations involved in the application of the hydrostatic test in determining live birth and breathing before birth for the purpose of criminal proceedings. In other words, the focus will be on the manner of determining live birth in legal theory. First, the legislative background to determining live birth will be discussed, where after the hydrostatic test as a forensic tool to determine live birth will be explained from a legal perspective. The remainder of the discussion will focus on the application of this test in the South African case of *S v Mshumpa* 2008 (1) SACR 126 (E). Legal developments with regard to the application of the hydrostatic test in the United Kingdom and various states in the USA will also be considered. The article will conclude with a review of foreign case law on the determination of live birth, feticide⁵ legislation and the application of the hydrostatic test.

2. Determining live birth

In terms of South African jurisprudence legal subjectivity is only afforded to a person upon live birth and, a foetus is only deemed to have been born alive if the birth was completed and there was complete separation between the mother and the child. The child must also have lived after the birth process. There is no prescribed period for which the new born must have lived in order to be classified as alive

³ *Van Heerden v Joubert NO & others* supra (n2) at 798G/H-H; Also see *Roe v. Wade*, 410 U.S. 113, 142 (1973).

⁴ Also see section 113 of the General Law Amendment Act 46 of 1935.

⁵ Feticide refers to the act that causes the death of a foetus; RA Jordaan and CJ Davel *Law of Persons 4ed* (2005) 12.

and to be afforded legal subjectivity and, there is also no prescribed method of determining whether the child had in fact lived. Moreover, the requirement that the birth must have been completed does not require that the umbilical cord be severed before it would be deemed that the child was born alive and legal subjectivity is afforded.⁶ This viewpoint on the commencement of legal subjectivity and the requirements for live birth date back to 530 AD and are supported in Roman and Roman-Dutch texts.⁷

Section 239(1) of the Criminal Procedure Act 51 of 1977 deals with infanticide or concealment of birth and provides for some indication of what this two pronged approach to the determination of a live birth and the commencement of legal subjectivity entail:

‘239. Evidence on charge of infanticide or concealment of birth.—

- (1) At criminal proceedings at which an accused is charged with the killing of a newly-born child, such child shall be deemed to have been born alive if the child is proved to have breathed, whether or not the child had an independent circulation, and it shall not be necessary to prove that such child was, at the time of its death, entirely separated from the body of its mother.
- (2) At criminal proceedings at which an accused is charged with the concealment of the birth of a child, it shall not be necessary to prove whether the child died before or at or after birth.’

Based on this provision, the appropriate manner in which to determine whether a foetus was born alive is to determine whether the foetus had breathed.⁸

From a medical perspective, however, the first breath drawn by the foetus is not necessarily a conclusive sign of life. Cunningham, for example, defines live birth (from a medical perspective) as:

‘The term used to record a birth whenever the new-born, at or sometime after birth, breathes spontaneously or shows any other sign of life such as a heartbeat or definite spontaneous movement of voluntary muscles. Heartbeats are distinguished from transient cardiac contractions, and respirations are differentiated from fleeting respiratory efforts or gasps.’⁹

And Knuppel submits that:

‘The central and motor pathways of the foetal respiratory system are active, and respiration at birth is the culmination of in utero processes. Two main types of foetal breathing movements are recognized...In general, these movements are governed by the same central nervous system patterns that

⁶ DSP Cronjé and J Heaton *Die Suid-Afrikaanse Personereg* 2ed (2003) 7.

⁷ *D* 25.4.1.1, 35.2.9.1; *C* 6.29.3; Voet 1.5.5. also *D* 50.16.129.

⁸ It is important to note, for the discussion in section 5 of this article, that independent circulation is not required for live birth.

⁹ FG Cunningham et al. Chapter 1: Overview of Obstetrics in *Williams Obstetrics* 23rd ed (2010).

control changes in foetal heart rate and body movements...The first breath of the new born normally occurs within the first 10 seconds after delivery. The first breath usually is a gasp, the result of central nervous system reaction to sudden pressure, temperature change, and other external stimuli. With the first breath, the slight increase in PO₂ may activate chemoreceptors to send impulses to the central nervous system respiratory centre and then to the respiratory musculature.¹⁰

It is clear from these two quotations that breathing as a requirement of live birth is not always easy to establish and must furthermore be distinguished from gasps or breathing efforts made by the foetus, since such gasps may not always be a clear and unequivocal sign of life but may rather be a reaction of the central nervous system to changing circumstances or surroundings. This distinction is often, from a legal point of view, overlooked but is of great importance as was evident in case of *S v Mshumpa*¹¹ discussed below.

3. The hydrostatic test

In the seventeenth century Wilhelm Gottfried Ploucquet devised a new method for determining whether a new-born had breathed based on the observation that breathing increases blood flow to the lungs, and that the ratio of body weight to the weight of the lung would therefore be significantly higher where the new-born had breathed compared to where the new-born had not breathed.¹² Breathing furthermore allows for the dispersion of air into the surfactant-rich liquid of mature lungs and assists with the formation of stable alveoli. Such pulmonary respiration will change the nature of the tissue from being red, heavy and dense to being white, light and less dense. In both Cronjé and Heaton¹³ as well as in Jordaan and Davel¹⁴ this hydrostatic test devised by Ploucquet, is described as the appropriate medico-legal test to determine live birth. The test is described as follows: The lungs of a recently born foetus are cut into pieces and then placed in water. If the lung tissue floats, it is accepted that the foetus had inhaled air and that it was absorbed into the lungs just before death. The lungs of a still-born child (a child that has not breathed) will, however, sink in water.¹⁵ The number of factors which could potentially influence

¹⁰ RA Knuppel Chapter 8: Maternal-Placental-Fetal Unit; Fetal & Early Neonatal Physiology in AH DeCherney et al *Current Diagnosis & Treatment Obstetrics & Gynecology* 10th ed (2007).

¹¹ 2008 (1) SACR 126 (E).

¹² MN Wessling Infanticide trials and forensic medicine: Württemburgs 1757-1793 in M Clark & C Crawford (eds) *Legal Medicine in History* (1994) 117-144.

¹³ Cronjé and Heaton op cit (n6) 7.

¹⁴ Jordaan and Davel op cit (n5) 12; Also see Moar op cit (n1) 109

¹⁵ Moar op cit (n1) 109.

whether lung tissue will float in water is nevertheless *legio*, and this test for live birth is consequently also criticised.¹⁶

Moar emphasised the risk of misdiagnosing live birth when using this test: ‘...[T]he majority of new born infants seen at autopsy show signs of varying degrees of decomposition, as they are often found in garbage, wrapped in newspaper or plastic bags, or lying in an open field. Even microscopic putrefaction can cause unexpanded lungs to float, when gas formation may not be macroscopically apparent. Naturally, any attempts at resuscitation may partially expand the lungs of a new born infant, leading to further difficulty in establishing live birth.’¹⁷ In other words, gases released during the process of decomposition (putrefaction) and that built up in tissue like the lungs may also cause lung tissue to float in water when the hydrostatic test is performed. Mouth-to-mouth resuscitation, external cardiac massage, and the administration of oxygen are other factors which can also lead to an erroneous conclusion regarding live birth.

Special care should therefore be taken to ensure that gases released during decomposition (or air and other gases that may have been absorbed by the lungs other than by natural breathing) are expelled from the lungs. To expel such air and gasses from the lungs and to counter the effects of any of these risk factors mentioned above, the application of the controversial compression test is suggested.¹⁸ The compression test requires that the lung tissue is placed between two wooden blocks and then compressed. This will expel gases caused by decomposition from the lung tissue, but will not expel inspired air. Since oxygen that was inhaled naturally cannot be expelled from lung tissue in this manner there is no risk that this test will adversely influence the outcome of the hydrostatic test. This method is, however, discarded by Knight who submits that the visual appearance of the tissue as well as the feel of the tissue is rather important. Fully respired lungs will be pink or mottled in appearance and spongy in texture while the lungs of a stillborn will be dark, small, heavy, dense, solid and liver-like.¹⁹ Unaerated lungs (lungs not supplied or filled with air) will have very little blood and will also not crackle when cut or pressed with the fingers as there will be no bubbles of air captured in the tissue.²⁰

¹⁶ Moar op cit (n1) 109; B Knight Infanticide and stillbirth in Knight, B (ed) *Forensic Pathology* (1990) 402 – 413 and B Knight & PJ Saukko *Knight's forensic pathology* 3rd ed (2004) 445-447.

¹⁷ Moar op cit (n1) 109. Also see *Morgan v State* 148 Tenn. 417, 256 S.W. 433 (1923).

¹⁸ Knight op cit (n16) 402-413.

¹⁹ Ibid.

²⁰ WF Rhodes, I Gordon & R Turner *Medical Jurisprudence* 2ed (1945) 183; Also see Knight & Saukko op cit (n16) 445-447.

Further valuable corroboration of the respiratory act can also be found in the presence of air in the stomach and intestines, as an infant's first breath is often coupled with the swallowing of air.²¹ Some pathologists also make use of other corroborative tests including the bladder test which rests on the assumption that a discharge of urine cannot take place without the action of the lungs. Another test devised by Plouquet and also used by some pathologists is known as the hemorrhhal test. In this test the relative weight of the lungs to the whole body is determined and the alteration produced in that relation by the act of breathing is set as 1 to 55 where the lungs have inhaled and 1 to 70 where the lungs have not been aerated. Daniel's test, on the other hand, takes into consideration the absolute gravity of the lungs and the other changes produced by respiration, the inflation of the lungs and the expansion of the chest.²²

Today the hydrostatic test is generally accepted as the standard test to determine whether the foetus had breathed. Yet, as was seen from the discussion above, this test for the determination of live birth is fraught with difficulty. Moar therefore correctly submits that the hydrostatic test should not be applied in isolation when determining whether breathing has occurred. While most reliance is usually placed on the hydrostatic test, supporting tests²³ and the careful consideration of the circumstances surrounding the death of/stillborn, should be kept in mind during the post-mortem examination.²⁴

4. Application of the hydrostatic test in *S v Mshumpa* 2008 (1) SACR 126 (E)

In *S v Mshumpa* Melissa Shelver was in the 38th week of gestation. On the morning of the incident Shelver and Best (her partner and father of the child) visited the gynaecologist who informed them that there were no complications and that an uneventful birth was anticipated. The couple was hijacked, however, by Ludwe Mshumpa outside the consulting room. Mshumpa gave Best instruction to drive to a remote destination where both Best and Mshumpa got out of the vehicle. Mshumpa shot Best in the shoulder and Shelver twice in the abdomen.

²¹ H Littlejohn 'Proof of life birth in criminal cases' (1922) 1:3187 *The British Medical Journal* 142-145. See AS Taylor and JJ Reese *A manual of medical jurisprudence* (1873) for a comprehensive discussion of the physical signs/tests for complete birth.

²² F Wharton *A treatise on the criminal law of the United States: Presedents of indictments and please, state trials of the United States etc.* (1855) 334.

²³ Supporting tests can include the liver floatation test for decomposition, the macroscopic appearance of the lungs, and the compression test which was discussed in the preceding paragraph.

²⁴ Moar op cit (n1) 109.

Although both Best and Shelver survived, the foetus could not be saved. It later transpired that Best was behind the staged hijacking and shooting and that he had devised the plan in order to get rid of the unborn child.

Both Best and Mshumpa were charged, *inter alia*, with the murder of the unborn child as the prosecution argued that South African jurisprudence has reached a state of development where the intentional killing of an unborn child in the womb of the mother constitutes murder.²⁵ An expert medical witness furthermore testified that foetal viability²⁶ in the 38th week of gestation was, at least on these set of facts, a certainty.²⁷ Moreover, when Best and Mshumpa was asked what crime they thought they had committed with regards to the foetus, both responded that their conduct was tantamount to murder.²⁸ Of greater importance is the evidence which was produced on behalf of the state by Dr Kirsten, a neo-natal medical expert.

According to Kirsten, the unborn child was indeed viable in the sense that it was almost absolutely certain that, had she been delivered by Caesarean section on the day of the incident, she would have been born alive and healthy. Medical science, it was submitted, now considers a foetus to be viable by the 25th week of gestation. And, it is generally required that a death notification form be completed for a foetus stillborn at 26 weeks. Kirsten also explained that the foetus would have experienced pain in the same manner as a normal living baby and, the foetus's reaction to the pain inflicted upon her by the two bullet wounds that entered her body caused a reaction that would normally manifest itself only upon normal birth and after being expelled from the womb. It was held that when a living person is shot and experiences great blood loss, one of the compensatory mechanisms of the body is to accelerate breathing in an effort to obtain more oxygen. Curiously, the same happened to the foetus in Shelver's womb. In reaction to the pain caused by the bullets the unborn foetus experienced an impulse for accelerated breathing. The forensic evidence submitted in support of this argument showed that the lungs of the unborn foetus was filled with amniotic fluid and red blood cells, indicative of the distress she had experienced by the pain of the bullet wounds and that this had triggered a breathing impulse

²⁵ *S v Mshumpa* 2008 (1) SACR 126 (E), para [10].

²⁶ The viability of a foetus, according to Lupton, refers to that stage of development at which a foetus can survive outside the womb on its own or with artificial life support. See ML Lupton 'The Legal Status of the Embryo' (1988) *Acta Juridica* 197-215, 205.

²⁷ *S v Mshumpa* 2008 (1) SACR 126 (E), para [48]; Lupton op cit (n26) 205; For a definition of the term preterm neonate, see Cunningham op cit (n 9).

²⁸ *S v Mshumpa* 2008 (1) SACR 126 (E), para [49].

and had caused her to inhale amniotic fluid as well as some of her own blood. Kirsten argued that the unborn foetus can therefore be said to have been alive in her mother's womb and had died there as a result of the gunshot wounds to her body. It was also submitted, from a medical point of view, that the unborn foetus's life and death inside the womb did not differ in its very nature from the life and death of a normal person living outside the womb. The only difference was the location where this foetus's life and death had occurred.²⁹

The reasoning in Kirsten's testimony is supported by many other medical scholars including Knuppel who said that a foetus probably suffers pain just as any other person and a near-term foetus has nearly all the neurological attributes of a newly born infant.³⁰ Yet, can the reasoning of the hydrostatic test be applied to this scenario? Since no oxygen entered the lungs, there would have been no macroscopically detectable change in the appearance of the lung tissue and, it would have remained "liver-like" as described by Knight.³¹ Also, the lungs would have sunk if placed in water because of the absence of oxygen. Yet, a novel application of the hydrostatic test, where the presence of amniotic fluid and red blood cells in lung tissue are tested for, could be used to determine whether the foetus had indeed experienced pain and whether the foetus had attempted to breath and could therefore be said to have been 'alive'. It was also submitted by the prosecution in the *Mshumpa* case that the medical evidence was conclusive that the intentional killing of such a foetus should, based on the foregoing, be regarded as murder.

Froneman J for the Eastern Cape High Court Division did not agree with such an extended development of the 'born alive' principle.³² He held that the Constitution does not expressly confer any rights onto an unborn child, and that the act of killing such an unborn child would not go unpunished as it would certainly be taken into consideration at the sentencing stage of criminal proceedings.³³ Froneman J also highlighted the following practical difficulties in formulating a reasonable, precise and extended definition of murder to include the killing of an unborn child:

- it is uncertain whether the viability of the foetus should be a pre-requisite;

²⁹ *S v Mshumpa* 2008 (1) SACR 126 (E), para [48].

³⁰ Knuppel op cit (n10) 402-413.

³¹ While the fully respired lung is pink or mottled in appearance and spongy in texture, the lungs of the stillbirth are dark, small, heavy and liver-like, even though they may still float. Knight op cit (n 19) 445-447

³² *S v Mshumpa* 2008 (1) SACR 126 (E), para [56].

³³ *S v Mshumpa* 2008 (1) SACR 126 (E), para [57].

- it is furthermore unclear whether such an extended definition should be restricted to third party killings and exclude the mother; and
- how such an extended definition would fit in with the criminal offence and sanction for illegal abortion under the Choice on Termination of Pregnancy Act 92 of 1996 is also fraught with potential problems.³⁴

Froneman J consequently concluded that these practical difficulties can be overcome and the killing of an unborn child can effectively be redressed within the ambit of the existing crime of assault against a pregnant mother. Such an approach, it was held, avoids the formal difficulties of formulating a precise definition for an extended crime of murder and also does not make the punishment of an injury or killing of an unborn child dependent on the stage that the pregnancy has reached.³⁵ The question remains, however, whether the medical expert evidence in support of the argument that the unborn foetus in the *Mshumpa* case had in fact suffered pain and had for all intents and purposes breathed, been given adequate recognition.

5. Should provision be made for the criminalisation of the killing of an unborn foetus in light of the medical evidence submitted in the *Mshumpa* case?

The question whether a person should be held criminally liable for causing the death of any living child which has not proceeded in a living state from the body of its mother,³⁶ by any act or omission which would have amounted to murder if such a child had been fully born, is no novel question in legal jurisprudence.³⁷ In this part of the discussion a short overview will be provided on the relevant case law and legislation on feticide in the United Kingdom as well as the different states of the United States of America.

In the 1833 English case *Rex v Richard Enoch and Mary Bully*³⁸ Justice Parke held that a child may indeed breathe before it is born, but its having breathed is not sufficiently indicative of life to make the killing of such a child murder. It was held that independent circulation

³⁴ *S v Mshumpa* 2008 (1) SACR 126 (E), para [58] to [59].

³⁵ *S v Mshumpa* 2008 (1) SACR 126 (E), para [64].

³⁶ In other words feticide. Feticide should be distinguished from infanticide. Feticide is the destruction of the life of the foetus, whereas, infanticide is the killing of a newborn child. See WF Rhodes, I Gordon & R Turner *Medical Jurisprudence* 2ed (1945) 178 – 189.

³⁷ It must be noted that if the child is intentionally fatally injured before it is born, but is born alive, and afterwards dies of that injury, it will be regarded as murder.

³⁸ *Rex v Richard Enoch and Mary Bully* 3 English Reports 172 (1833).

is also required before it can be concluded that the child was born alive.³⁹ And, in another English case *Rex v Sellis*⁴⁰ it was held that affirmative proof that the child had breathed was not decisive proof that the child was born alive as it may have breathed and yet died before birth because the whole body of the child had not been born when the lung inflation had occurred.⁴¹ Constant criticism to the independent circulation test, first set out in the 1833 case of *Enoch and Bully*, led to the passage of the Infant Life Preservation Act of 1929 in the United Kingdom. This Act is still in force today.⁴² The Act is, for all intents and purposes, a feticide statute criminalising the intentional destruction of a child that is capable of being born alive.⁴³ In terms of this Act, evidence that a woman who had at any material time been pregnant for a period of twenty-eight weeks or more shall be prima facie proof that she was at that time pregnant of a child capable of being born. It is therefore no longer required for live birth that an independent circulation be proofed; the viability of the foetus and its capability of being born alive is now the only prima facie proof necessary. The question of live birth has consequently become superfluous in defining culpability for the destruction of a viable foetus.⁴⁴

In a landmark American case *Morgan v State*⁴⁵ the Supreme Court of Tennessee agreed with the English courts' findings, that the test for being born alive is breathing and this test is not infallible as infants sometimes breathe before they are fully delivered and sometimes they do not breathe for a perceptible period after they had been delivered. However, once respiration is established, independent circulation is also established and, that is then indicative of independent existence.⁴⁶ In *People v Hayner*,⁴⁷ however, the New York Court of Appeals reminded that whatever the true test may be in medical science with regard to live birth, in the theory of law it is whether the child is able to carry on

³⁹ ST Ishmael 'Proving live birth in infanticide' (1962-1963) 17 Wyoming Law Journal 237-243 at 237.

⁴⁰ *Rex v Sellis* 173 Eng. Reprint 370 (1837).

⁴¹ Ishmael op cit (n39) 238.

⁴² Infant Life Preservation Act of 1929, Statute Book 19 & 20 Geo. 5 Chapter 34. L Westerfield 'The born alive doctrine: A legal anachronism' (1975-1976) 2(2) *Southern University Law Review* 149-174 R 150-151. JA Meldman 'Legal concepts of human life: the infanticide doctrines' (1968) 52 *Marquette Law Review* 105-115.

⁴³ L Westerfield op cit (n42) 150-151.

⁴⁴ Westerfield op cit (n42) 151.

⁴⁵ 148 Tenn. 417, 256 S.W. 433 (1923); Also see *Shedd v State* 178 Ga. 653, 173 S.S. 847 (1934).

⁴⁶ Independent circulation was also required in *State v Winthrop* 2843 Iowa 519 (1876). Ishmael op cit (n39) 238; Westerfield op cit (n42) 150-151.

⁴⁷ 300 N.Y. 171, 90 N.E.2d 23 (1949).

its being without the help of the mother's circulation. It was also held that the expansion of the lungs was of no great moment because the legal test of live birth requires a separate circulation made irrelevant by the question whether the child had breathed or not.⁴⁸ Although the independent circulation test was confirmed in the *Hayner* decision, the court also indicated that live birth could only be proved by a witness who either heard or saw the infant cry at the time of the birth.⁴⁹

Yet, in *People v Chavez*⁵⁰ the California court came to a different conclusion and rejected the majority holdings on the question of live birth. It held that there is no reason why an infant should not be considered a human being when born or removed from the body of its mother and when it has reached the stage of development where it is capable of living an independent life as a separate being and where in the natural course of events it will so live if given a normal and reasonable chance. It was also held that a viable child in the process of being born should be regarded as a human being afforded with legal subjectivity. 'While the question of whether death by criminal means has resulted while the process of birth was being carried out, or shortly thereafter, may present difficult questions of fact, those questions should be met and decided on the basis of whether or not a living baby with the natural possibility and probability of growth and development was being born, rather than on any hard and fast technical rule establishing a legal fiction that the infant being born was not a human being because some part of the process of birth had not been fully completed.'⁵¹

This judgement was also followed in *Singleton v State*⁵² and *Keeler v Superior Court*.⁵³ In the latter case the California Court of Appeal for the Third District held that when a foetus had developed to the stage of viability, it is a human being for the purpose of California's homicide statutes.⁵⁴ (This decision was later overruled by the California Superior Court.)⁵⁵ Thereafter, numerous tests developed in the different USA state courts and after the New York Legislature passed a feticide

⁴⁸ Ishmael op cit (n39) 239; Westerfield op cit (n42) 150-151.

⁴⁹ Westerfield op cit (n42) 150-151. The *Hayner* judgement was also confirmed in *State v Osmus* 73 Wyo. 183, 276 P.2d 469 (1954). Ishmael op cit (n39) 240; Also see *Bennett v. State*, 377 P.2d 634 (Wyo. 1963) in which the Osmus judgement was repudiated to a certain extent. In *Bennett* much more reliance is placed on medical testimony and expert evidence.

⁵⁰ 77 Cal. App. 2d 621, 176 P.2d 92 (1947).

⁵¹ Ishmael op cit (n39) 240.

⁵² 33 Ala. 536, 35 So. 2d 375 (1948).

⁵³ 80 Cal. Rptr. 865 (Dist. Ct. App. 1969).

⁵⁴ Ishmael op cit (n39) 240.

⁵⁵ 38 U.S.L.W. 2696 (Cal. Sup. Ct. June 12, 1970).

statute⁵⁶ in 1830, other states soon followed with similar legislation.⁵⁷ These statutes often used quickening as the general criterion for viability. Quickening precedes viability and tends to occur around the fourth or fifth month of pregnancy when the mother first starts to feel foetal movement. Viability is generally said to occur near the sixth or seventh month of pregnancy.⁵⁸ Today the difference between quickening and viability has become almost irrelevant.

In 1967 the New York code⁵⁹ was amended to provide for twenty-four weeks as the viability criterion of a foetus and in 1970 murder was redefined in the California Penal Code⁶⁰ to include the killing of a foetus.⁶¹ By 2010 thirty-four states in the USA had foetal homicide laws, nine states had provisions explicitly targeting violence against pregnant women and seven states and the District of Columbia had neither foetal homicide laws nor any criminal laws specifically penalising violence against pregnant women.⁶² In 2004 USA Congress passed federal legislation on feticide, the Unborn Victims of Violence Act (UVVA).⁶³ This Act criminalises the death of or bodily injury to an unborn child or child in utero⁶⁴ as a separate offence.⁶⁵ To obtain a conviction under the UVVA it must be established, beyond a reasonable doubt that a defendant had criminal intent towards some victim, had violated one of the federal laws enumerated in the statute⁶⁶ and that this criminal conduct caused the death of an unborn child. The same punishment will be imposed as if the defendant had committed the crime against the foetus's mother.⁶⁷

⁵⁶ N.Y. Rev Stat of 1829, pt. IV, ch. 1, tit, 2, § 8;

⁵⁷ Arkansas Stat. Ann. § 41-2223 (1964); 22 Fla. Stat. Ann. § 782.09 (1965); 2 Kansas Stat. Ann. § 21-409 (1964); 25 Michigan Stat. Ann. § 28.554 (1954); 2A Mississippi Code Ann. § 2222 (1942); 2 N.D. Century Code § 12-25-03 (1960); Oklahoma Stat. Ann. 21, § 713 (1958).

⁵⁸ Westerfield op cit (n42) 154; J Pedone 'Filling the Void: Model Legislation for Fetal Homicide Crimes' (2009) 43(1) *Columbia Journal of Law and Social Problems* 77-116 at 81.

⁵⁹ N.Y. Penal Law § 125.00

⁶⁰ West's Ann. Cal. Penal Code (West Supp. 1971),

⁶¹ Westerfield op cit (n42) 155, also for a discussion on the legal reforms with regard to infanticide in the State of Louisiana.

⁶² Pedone op cit (n58) 78.

⁶³ Pub. L. No. 108-212, 118 Stat. 568 (codified as amended at 10 U.S.C. § 919(a), 18 U.S.C. § 1848 (2006)).

⁶⁴ This, in terms of 18 U.S.C. § 1841(d) (2006), refers to a member of the species *homo sapiens* at any stage of development who is carried in the womb.

⁶⁵ 77. 18 U.S.C. § 1841(d) (2006); Pedone op cit (n 58) 93.

⁶⁶ Including most notably terrorist attacks, threats against a witness in a federal proceeding, violence at an international airport, drug-related killings, attacks involving interstate stalkings, and domestic violence on military bases.

⁶⁷ Pedone op cit (n58) 93.

It is evident that many divergent opinions exist on whether an unborn but viable foetus (viability being determined by an even more divergent range of tests and opinions) should acquire some level of legal personhood for the purpose of criminal proceedings. In the UK and in most states in the USA this contentious problem has been addressed by adopting feticide legislation that criminalises the intentional killing of a viable foetus. When exactly a foetus is regarded as viable, however, differs from jurisdiction to jurisdiction. Froneman J in the *Mshumpa* case also held that it might be necessary for the legislature to create a separate statutory crime of feticide.⁶⁸ A more detailed discussion of the content and working of such feticide legislation do not fall within the ambit of this article since the primary focus of this article is on the medico-legal evidence and concerns with regard to the born alive doctrine. It must however be made clear that feticide legislation, in general, does not interfere with abortion laws. Feticide legislation is aimed at remedying a harm that occurs without the consent of the woman. The violent actions taken against the woman and her foetus are not done by her own choice, for her benefit and do not concern the protection of her constitutional right to bodily integrity and privacy. Feticide legislation only contemplates a third-party's violent actions against a pregnant woman so that both that woman and her foetus are victims in the eyes of the law.⁶⁹

6. Conclusion

Based on this concise review of case law on the determination of live birth and when a foetus is viable, it seems as though we are still struggling with the medieval question of *mediate animation*, or the moment when the soul enters the foetus. From a medico-legal point of view two major tests have developed for use in proving the live birth of a foetus. Some jurisdictions, including South Africa, adopted a breathing test which requires that the foetus must have breathed. It was evident from the discussion above that this criterion is not necessarily indicative of life, and pathologists like Littlejohn argue that only complete respiration or respiration involving the greater part of both lungs is positive proof of live birth in a legal sense.⁷⁰ A second requirement put forward by the majority of courts in the UK and USA requires, in addition to the requirement that the foetus must have breathed, that the foetus must also have an independent circulation

⁶⁸ *S v Mshumpa* 2008 (1) SACR 126 (E), paras [49]; [59] and [65].

⁶⁹ Pedone op cit (n58) 78; Also see AK Bruchs 'Clash of competing interests: Can the unborn victims of violence act and over thirty years of settled abortion law co-exist peacefully?' (2004) 55(1) *Syracuse Law Review* 133 – 159.

⁷⁰ Littlejohn op cit (n21) 142.

in order to be afforded legal subjectivity and be deemed to have been born alive.

Medical science has, to date, not developed a medical test to determine whether a foetus has independent circulation. Nor, has the courts developed a legal meaning for the concept of independent circulation.⁷¹ Generally it is said that an infant that exists separate from its mother will be deemed to have an independent circulation. Medical evidence has also shown that as a foetus becomes viable it has its own circulatory system and can therefore be said to have an independent circulation. Yet, other jurisdictions even pose a third requirement, that the umbilical cord is severed. In South Africa it is only required in terms of s 239 of the Criminal Procedure Act 51 of 1977 that it be proved that the child had breathed. It is not necessary that the umbilical cord be severed nor is prove of an independent circulation required. Medically speaking it is easier to determine whether a child had breathed (via the hydrostatic test) than to determine whether there was independent circulation. However, as was evident from the discussion above, this requirement – that the foetus had breathed – is also not without its potential pitfalls.⁷²

The hydrostatic test, although not perfect, is still one of the most effective tests to determine live birth. Care should, however, be taken not to rely on the results of this test alone, but rather to come to a conclusion only after other tests (such as the liver flotation, macro- and microscopic analysis, etc.) have also been considered. The surrounding circumstances and all possible influences that may affect the outcome of the finding must also be kept in mind. It was furthermore clear from the discussion in part 3 of this article that the fact that a foetus had breathed is not always indicative of life. It was shown that the first breath drawn by a foetus is not necessarily a conclusive sign of life as the central and motor pathways of the foetal respiratory system are active and respiration may be the result of the central nervous system reacting to sudden pressure, temperature change and/or external stimuli. It is furthermore not even essential that a foetus should have breathed at the time it was killed, as many children are born alive, and yet do not breathe for some time afterwards.

While it can therefore rightly be asked why, the killing of a foetus should not be regarded as murder if the foetus was indeed viable and a possibility if independent life existed, the difficulty in proving with reasonable certainty that the foetus was indeed viable and alive from a medical point of view, and could therefore be afforded with legal

⁷¹ Westerfield *op cit* (n42) 150.

⁷² In terms of the born alive doctrine an unborn child must be born alive and die from prenatal injuries inflicted upon it before it can be the subject of a murder trial. Ishmael *op cit* (n39) 242. Westerfield *op cit* (n42) 149.

subjectivity, is an almost impossible task. It is therefore important for the legislature to consider the possibility of criminalising conduct which, due to its violent nature, negatively affects the unborn child. Such legislation will eradicate the need to determine live birth and/or viability and/or breathing in cases like that of *Mshumpa* and at least for the purpose of criminal prosecution where criminal conduct fatally injured an unborn child.